What is claimed is:

1. An oxide semiconductor electrode comprising: a conductive substrate; and an oxide semiconductor layer provided on said conductive substrate, said oxide semiconductor layer being a porous layer comprising a plurality of porous titania particles which have been joined to each other to define interparticulate communicating pores.

2. The oxide semiconductor electrode according to claim 1, wherein the pores possessed by the titania particles per se have a diameter of 10 to 40 nm.

3. The oxide semiconductor electrode according to claim 1, wherein said interparticulate communicating pores have a diameter of 10 to 70 nm.

4. The oxide semiconductor electrode according to claim 1, wherein said titania particles have an average diameter of 10 to 70 nm.

5. The oxide semiconductor electrode according to claim 1, wherein said joined titania particles bear on their surface visible region sensitizing dye molecules.

6. The oxide semiconductor electrode according to claim 5, wherein said visible region sensitizing dye molecules are molecules of a ruthenium oxide complex.

7. The oxide semiconductor electrode according to claim 1, wherein said conductive substrate is formed of a flexible material.

8. The oxide semiconductor electrode according to claim 7, wherein said flexible material is a light transparent resin film.

9. The oxide semiconductor electrode according to claim 1, wherein said oxide semiconductor layer has a thickness of 10 to 70 μm.

10. A process for producing the oxide semiconductor electrode as defined in claim 5, said process comprising the steps of: adding visible region sensitizing dye molecules to a solution of a titanium alkoxide; coating the solution with said visible region sensitizing dye

molecules added thereto onto a conductive substrate; and allowing a gelling reaction to proceed in the coating to form an oxide semiconductor layer.

11. A process for producing the oxide semiconductor electrode as defined in claim 1, said process comprising the steps of: coating a solution of a titanium alkoxide onto a conductive substrate; and applying ultraviolet light, ultrasonic waves in a liquid, or a high frequency to the coating before drying of the coating to allow a gelling reaction to proceed in the coating, thereby forming an oxide semiconductor layer.